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METHOD FOR ESTABLISHING A CONNECTION IN A TELECOMMUNICATIONS
NETWORK
BACKGROUND

a [0001] The present invention relates to a method for establishing a connection from an initiating subscriber to a destination subscriber in a telecommunications network without the respective initiating subscriber knowing the permanent identifier of the destination subscriber.

sub a1 [0002] A request for a call inevitably involves the disclosure of one's own telephone number. In the case of newspaper advertisements, a way out presents itself mostly via a box number which, however, prevents an immediate contact of the interested party with the advertiser, resulting in delays. Moreover, the interested party then has to express himself/herself in writing. However, if the telephone number is indicated in a newspaper advertisement, then it is mostly possible to identify the owner of the telephone number via electronic data bases which allow a number search, resulting in the possibility of abuse. Thus, for instance, a public offer of selling a precious object may attract burglars. The possibility of publishing an advertisement under a box number has to be completely ruled out for some publications such as in the case of pin walls with private announcements in stores or schools.

a **SUMMARY OF THE INVENTION**

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ins a3 [0003] Therefore, the object of the present invention is to open to a subscriber of a telecommunications network the possibility of being called without the caller knowing his/her telephone number, hereinafter also referred to as permanent identifier.

[0004] This objective is achieved according to the present invention

- in that an anonymous identifier is assigned to the permanent identifier of the destination subscriber by a confidence instance,
- in that, for establishing the connection via the initiating subscriber while using the anonymous identifier, the utilized identifier is recognized by the particular active switching center as an anonymous identifier and routed to the confidence instance,
- in that the confidence instance determines the assigned permanent identifier from the

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received anonymous identifier and transmits it to the switching center,

- in that the switching center proceeds to establish the connection to the destination subscriber while using the transmitted permanent identifier.

[0005] Although a first field of application of the method according to the present invention is telephony, the use in other telecommunications networks, in particular data networks, is not to be excluded.

[0006] An advantageous embodiment of the method according to the present invention consists in that the confidence instance is constituted by a code server in conjunction with a service control function of the telecommunications network which is at least partially designed as an intelligent network, and in that the routing of the anonymous identifier from the switching center and the transmission of the permanent identifier to the switching center take place via a service switching function of the intelligent network.

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[0007] To limit the stock of numbers which has to be kept ready for the anonymous identifier, it is provided according to a refinement to delete the anonymous identifier at a predetermined time after the assignment. In a practical application of the method according to the present invention, the predetermined time will be established in accordance with the period of time within which the destination subscriber will still expect calls after his/her publication, for example, the advertisement, such as, for example, one or two weeks. Due to this time limitation of the anonymous identifier, moreover, an insignificant interest in an unauthorized intrusion into the confidence instance is to be expected so that simple protective measures are sufficient, if indicated.

[0008] In the method according to the present invention, moreover, provision can be made for the anonymous identifier to be deletable by an input of the destination subscriber. In this manner, it is possible, for example, to prevent the destination subscriber from receiving further calls concerning an advertised object after it has been sold. The deletion of the code can be indicated to further callers by an appropriate spoken message.

sub a 5 [0009] Another beneficial embodiment of the present invention consists in that a permanent identifier can be assigned only one anonymous identifier at a time. In this manner, an abusive extension of the assignment of anonymous identifiers is prevented.

[0010] In an expedient embodiment of the present invention, provision is made for an authorization check to be carried out before the confidence instance assigns the anonymous identifier. This check can prevent, for example, an unauthorized person from generating an anonymous identifier for a call number.

[0011] Moreover, provision can be made for the confidence instance to output error messages when an assignment is not possible. Such error messages can say:

- an anonymous identifier already exists for the entered call number,
- the entered call number was not correct,
- the request could not be carried out due to a system error.

sub a 6 [0012] According to an advantageous embodiment of the present invention, a user-friendly assignment of the anonymous identifier can be effected in that the request for the assignment of the anonymous identifier and the communication thereof take place over the internet.

Consequently, the user can be advantageously guided via suitable graphical user interfaces, information and entries complementing one another in an expedient manner.

[0013] Further ways to request the assignment of the anonymous identifier and to communicate it to the destination subscriber are, in the ISDN, preferably via the D-channel or, in the case of other digital subscriber lines via suitable channels, in analog and also digital networks via the multifrequency method, by short messages (SMS), electronic mail (E-mail), and via voice input and output. Depending on the individual conditions, it is also possible to use mixed forms such as requesting by means of transmission via the multifrequency method and communication via voice output, which allows the use of a simple telephone with an analog subscriber line.

[0014] When using the method according to the present invention for the applications mentioned at the outset, the method is preferably designed in such a manner that the assignment is requested by an input of the destination subscriber. It is then completely up to the destination subscriber whether he/she wants to use an anonymous identifier, hereinafter also referred to as code.

[0015] In modern telephone networks, the call number of the calling subscriber is automatically transmitted to the called subscriber. For legal provisions on data security and privacy, a calling subscriber has the possibility of suppressing the transmission of his/her own call number to the called subscriber. Because of this, the called subscriber will later not be able to call back the caller unless he/she knows the call number of the caller anyway.

[0016] In some cases, however, it can be desirable for both subscribers that such a return connection can be established on request of the called subscriber without the calling subscriber disclosing his/her call number.

[0017] A further embodiment of the present invention makes this possible in that the request for the assignment between the anonymous and the permanent identifiers takes place during the dialing of a permanent identifier of a later initiating subscriber by the destination subscriber, and in that the anonymous identifier is transmitted to the later initiating subscriber. This procedure can be started by the destination subscriber by entering an appropriate prefix.

[0018] The return connection is then preferably established in that the anonymous identifier is converted by the confidence instance into the permanent identifier of the destination subscriber upon request of the initiating subscriber, and in that the return connection to the destination subscriber is established using the permanent identifier.

[0019] This embodiment of the present invention allows a subscriber to receive return calls

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while keeping his/her anonymity. For instance, in the case of psychological counseling telephone services, the necessity can arise to provide comprehensive, qualified counsel by way of a return call without having to remove the anonymity of the caller. Another application case can be the query of a data base. In spite of the telephonic transmission of the query results by means of a return call, no conclusions about the inquiring person are possible.

[0020] In a refinement of the present invention, provision is made for the destination subscriber to be informed of this fact by a perceivable signaling when a return call is established using the anonymous identifier. It is then possible for the destination subscriber to adapt his/her behavior, in particular, to accept or reject the return call.

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[0021] In a further refinement of this specific embodiment, a return call between the initiating subscriber and the destination subscriber can also be achieved in that a connection requested by the initiating subscriber is automatically established from the destination subscriber upon completion of the signaling after the destination subscriber has confirmed that a connection is to be established, the connection being automatically effected from the destination subscriber to the initiating subscriber.

[0022] The conversion of the permanent identifier of the destination subscriber into the anonymous identifier can be effected in that the permanent identifier is transmitted to a code server linked to the network, in that the code server converts the permanent identifier into a free anonymous identifier and stores the anonymous identifier for the period of validity thereof with the permanent identifier being assigned thereto, and in that the code server outputs the anonymous identifier which is transmitted to the initiating subscriber.

[0023] The conversion of the anonymous identifier of the destination subscriber into the permanent identifier for the purpose of the return call can be effected in that the anonymous identifier is transmitted to the code server, and in that the code server, by way of the stored assignments, retrieves and outputs the permanent identifier.

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[0024] The establishment of an anonymous connection between the destination subscriber and a called initiating subscriber can be carried out in that the identifier of the destination subscriber is routed to a service control function by an appropriate switching center, in that the service control function obtains an anonymous identifier from a code server while indicating the identifier of the destination subscriber, in that the code server converts the identifier into a free anonymous identifier and stores the anonymous identifier for the period of validity thereof with the permanent identifier being assigned thereto and outputs the anonymous identifier to the service control function, in that the service control function routes the anonymous identifier to the switching center, and in that the switching center establishes the connection with the called initiating subscriber while indicating the anonymous identifier.

sub a 8 [0025] To allow the code server to be identified, another refinement of the present invention makes provision for an identifier which identifies the code server to be added to the anonymous identifier.

[0026] The establishment of a connection-back between the initiating subscriber and the destination subscriber can be carried out in that the anonymous identifier of the destination subscriber is routed to a service control function by an appropriate switching center of the network, in that the service control function obtains the permanent identifier of the destination subscriber from the appropriate code server while indicating the anonymous identifier, in that the service control function routes this identifier to the switching center, and in that the switching center establishes the connection with the destination subscriber.

[0027] The method according to the present invention can advantageously be used in such a manner that the telecommunications network is a circuit-switched network for voice or data transmission, and that the identifiers are telephone numbers. In this connection, preferably, provision is made for the anonymous telephone number to include a dialing prefix for dialing up the confidence instance.

[0028] Other applications can consist in that the telecommunications network is a network for transmitting data of any kind, including video and audio data and/or textual messages and in that the identifiers are user addresses of this network.

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[0029] Exemplary embodiments of the present invention are depicted in the drawing with reference to several Figures and will be explained in greater detail in the following description.

[0030] Fig. 1 shows a schematic representation of a first embodiment of the present invention,

Fig. 2 depicts a flow chart on the assignment of the anonymous identifier in accordance with the method according to the present invention,

Fig. 3 represents a flow chart on the establishment of a connection in accordance with the method according to the present invention,

Fig. 4 shows a schematic representation to illustrate a second embodiment of the present invention,

Fig. 5 is a flow chart on the establishment of a forward connection,

Fig. 6 shows a flow chart on the establishment of a return connection according to the second embodiment, and

Fig. 7 depicts a flow chart on the communication in an electronic news system in accordance with the method according to the present invention.

[0031] In the Figures, identical parts are provided with the same reference symbols.

DETAILED DESCRIPTION

a [0032] Fig. 1 shows an intelligent network 1, for example a digital network with a digital subscriber line, of which are represented an individual switching center V having a switching unit 2, a subscriber line group 3, and a service switching function 4 (conforming to ITU-T Q.1211) for coupling the intelligent network to the distributed switched network as well as a service control function S and a code server C which is constituted by a computer which carries out the conversion of the anonymous identifies into permanent identifiers and vice versa and which stores the assignments of the identifiers to the subscribers in a data base. In the example, two subscriber lines A and B are linked to the same switching center V. Numerous switching centers exist in the network. In the event that two subscribers to be connected are not linked to the same switching center, the processes described in the following take place analogously.

[0033] Moreover, user U of subscriber line B possesses a terminal T, for example a computer, which has access to the Internet and which permits a data exchange with service control function S of intelligent network 1, possibly via further components which are not shown (for example SMF). Moreover, service switching function 4 is connected with service control function S via an INAP interface.

[0034] Service control function S has access to code server C via an API interface or via a logically equivalent communications protocol. Because of this, requests such as "translateCaller ID()" and "translateCode()" which basically means "translate the permanent identifier of the caller indicated in brackets" and "translate the anonymous identifier" can be routed to code server C.

[0035] For instance, if user U of subscriber line B wants to place a newspaper advertisement 5 without thereby publishing his/her telephone number in connection with the advertised object, he/she can request the assignment of an anonymous identifier via terminal T and the Internet which is not shown. For this purpose, he/she is provided by service control function S or an interposed component with an input mask via which he/she enters his/her own call

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number and the request to be provided with an anonymous identifier. Service control function F forwards this request to the code server. Provided that no code has been stored yet for this subscriber line B and that no other reasons exist for refusing an anonymous identifier, such an anonymous identifier is generated and communicated to user U via his/her terminal T. The user can then make the code known in the newspaper advertisement or another publication.

[0036] For instance, if the user of subscriber line A wants to get into contact with the advertiser, he/she dials the code indicated in the advertisement. The code includes a dialing prefix (for example 0151) from which switching center V (Fig. 1) recognizes that this is an anonymous identifier. Therefore, service switching function 4 inquires of code server C via service control function S which permanent identifier is assigned to this anonymous identifier and receives in response the permanent identifier which is then routed to the switching unit for establishing the connection to subscriber line B.

[0037] Fig. 2 shows the procedure for assigning an anonymous identifier. Initially, request AN for an anonymous identifier is transmitted from terminal T to service control function S which returns a mask to the terminal into which user U enters his/her permanent subscriber number PKB (that is the call number of subscriber line B). The subscriber number reaches code server C via service control function S, the code server generating an anonymous subscriber number AKB of subscriber line B and returning it to terminal T via S.

[0038] Fig. 3 depicts the establishment of a connection from subscriber A to subscriber B with the assistance of anonymous identifier AKB. To this end, the anonymous identifier AKB is initially dialed by subscriber A and thus routed to switching center V which, after recognizing that this is an anonymous identifier, queries the permanent identifier from code server C, as described above. Subsequently, the connection establishment is completed so that the call reaches subscriber line B.

[0039] The configuration shown in Fig. 4 is similar to that according to Fig. 1; however,

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subscriber B not being allocated a separate terminal. A configuration of that kind can, on one hand, be used to request the assignment of the anonymous identifier over the telephone of subscriber B via suitable data transmission types so that subscriber B can make known a code, similarly as in Fig. 1. On the other hand, the configuration according to Fig. 4 can also be used to anonymize the identifier of subscriber B for certain conversations, which will be explained in the following with reference to Figures 5 and 6.

[0040] When destination subscriber B calls later the initiating subscriber A, then the connection request of destination subscriber B is transmitted (H1) to connected switching center V via the layer 3 protocol DSS1 of the ISDN network as shown in Fig. 5. To activate the code service, destination subscriber B places a prefix (for example 0150) before the call number of initiating subscriber A. Thereupon, at H2, switching center V sends a request to service control function S via service switching function 4 under the INAP protocol. The dialed call number of initiating subscriber A is partially input along with the request at H2 as an argument. Then, at H3, additional digits of initiating subscriber A are requested subsequently. At H4, the quantity of subsequently requested digits is transmitted. The call number routed by destination subscriber B at H4 via switching center V at H5 is used at H6 by the service control function to request an anonymous identifier from code server C, the anonymous identifier being transmitted to service control function S at H7 and, at H8, finally to the switching center which, at H9, establishes a connection to initiating subscriber A while transmitting the anonymous identifier of destination subscriber B.

[0041] As shown in Fig. 6, steps R1 through R9 are carried out correspondingly if initiating subscriber A requests a return connection to subscriber B who is unknown to him/her with the aid of the anonymous identifier and of a preceding dialing prefix (for example 0151). At R6, service control function S requests the anonymous identifier to be translated back into the identifier of destination subscriber B. Code server C delivers the identifier of destination subscriber B from its data base, and the connection can be established at R9.

[0042] Fig. 7 shows how a destination subscriber B routes a request to a code server C at

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N1. Code server C converts the identifier of destination subscriber B into an anonymous identifier and, at N2, routes the request, together with the anonymous identifier, to news server N of the news system requested by destination subscriber B where it is published. An initiating subscriber A who logs on to the system at N3 reads the request of destination subscriber B at N4. If initiating subscriber A wants to reply thereto, then he/she, while indicating the anonymous identifier of destination subscriber B, sends his/her answer to code server C at N5 which routes it to destination subscriber B at N6.